

Claims

1. An ultrasound imaging system comprising:
a probe (10) with an array of transducer elements (12) for acquiring
ultrasound data of a body, including moving tissue and fluid flow;
5 a beamforming system (10, 12, 14, 16) for emitting and receiving
ultrasound beams in said body, which uses, for each transmission beam, an
ensemble length of more than two temporal samples and less than eight;
processing means (40, 50) to process flow Doppler signals comprising
adaptive clutter demodulation (21) applied on amplitude signals and means
10 clutter demodulation applied on phase signals followed by high-pass filtering
(22, 32);
and display means (55,70) to display images based on said processed
flow Doppler signals.
- 15 2. The ultrasound imaging system of claim 1, wherein the filtering means
comprises second order Infinite Impulse Response filters.
3. The ultrasound imaging system of claim 1, wherein the filtering means
comprises third order Infinite Impulse Response filters for filtering amplitude
20 signals.
4. The ultrasound imaging system of one of Claim 1 to 3, wherein the
filtering means are followed by post-processing means comprising spatial
averaging means for yielding respectively power Doppler signals from the
25 amplitude signals and flow velocity signals from the phase signals.
5. The ultrasound imaging system of one of Claims 1 to 4, wherein the
post processing means comprises amplitude averaging means applied to the
amplitude data and velocity averaging means applied to the velocity data
30 resulting of high-pass filtering means, for performing a spatial averaging of the

results provided by said filters and permitting of compensating for the use of small ensemble length less than eight.

6. The ultrasound imaging system of Claim 5, wherein the processing
5 means comprises a color flow velocity processor for mapping flow velocity values on color values.

7. The ultrasound phased array imaging system of Claim 5, wherein the
processing means comprises a color power processor for mapping the estimated
10 power magnitude on color values.

8. The ultrasound imaging system of one of Claims 1 to 7, comprising a B
mode processor for processing the amplitude information of the echo signals
(RF), on a spatial basis, for the formation of structural images of the tissue.
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9. The ultrasound imaging system of one of Claims 1 to 8, comprising:
a display processor for processing the B mode data, color flow velocity
data, color power data, and an image memory for memorizing the image data for
display; and
20 a user control for the user to select the images to display in one mode
or in combined modes.

10. An ultrasound examination apparatus having a probe for acquiring
ultrasound data and coupled to a system as claimed in one of Claims 1 to 9.
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11. A program product having a set of instructions for operating the
functions of the means of the system as claimed in one of Claims 1 to 9.